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EXAMINER
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PHAM, KHANH B

ART UNIT	PAPER NUMBER
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2166

MAIL DATE	DELIVERY MODE
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07/03/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/669,523

Applicant(s)

WEISSMAN ET AL.

Examiner

Khanh B. Pham

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period **will** apply and **will** expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply **will**, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-25 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Brown et al. (US 2003/0088579 A1) and in view of Guthrie et al. (US 6,587,854 B1), hereinafter “**Brown**” and “**Guthrie**”.

**As per claim 1**, Brown teaches a method of optimizing a query in a database comprising:

- “generating tenant-level statistics for one or more of said plurality of tenants for one or more of the data table” at page 4, [0043];
- “receiving a SQL query” at page 3, [0033];
- “optimizing the SQL query based on the statistic” at page 3, [0033]-[0034].

Brown does not explicitly teaches the database is a multi-tenant database, “wherein a plurality of tenants have data stored in the data tables” as recited in the preamble of claim 1. However, Guthrie teach a multi-tenant database having one or more data tables, each table having one or more logical columns defining data categories and one or more logical rows associated with one or more tenants, wherein a plurality of tenants have data stored in the data tables” at Col. 4 line 66 to Col. 5 line 15.

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Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was make to combine Brown and Guthrie's teachings to optimize query based on enterprise-level statistic (i.e., "tenant level statistic") in a multi-tenant database, in order to provide more accurate method and reduce the processing time since only a subset of data which associated with a particular tenant are processed instead of a whole table.

**As per claim 2**, Brown and Guthrie teach the method of claim 1 discussed above. Guthrie teaches: "wherein each tenant includes one or more associated users" at Col. 5 lines 64-67. Brown also teaches:

- "generating user-level statistics for one or more of the users of one or more of the tenants for one or more of the data tables" at page 4, [0043]; and
- "optimizing the SQL query based on the user-level statistic" at page 3, [0033].

**As per claim 3**, Brown and Guthrie teach the method of claim 2 discussed above. Brown also teaches: "wherein the user-level statistics are stored to a user-metadata table" at page 4, [0045].

**As per claim 4**, Brown and Guthrie teach the method of claim 2 discussed above. Brown also teaches: "wherein generating user-level statistics includes determining a total number of distinct rows for each of said plurality of users" at page 4, [0047], [0051].

**As per claim 5**, Brown and Guthrie teach the method of claim 4 discussed above. Guthrie also teaches: “wherein the total number is an approximate number based on one or more of a) a number of rows viewable by the user and user below the user in a role hierarchy, b) a number of rows that are shared by a group to which the user belongs and c) a number of rows that are manually shared to the user by another user or group of users” at Col. 5 lines 1-6.

**As per claim 6**, Brown and Guthrie teach the method of claim 2 discussed above. Brown also teaches: “wherein generating user-level statistics for a user is performed according to one of a) on a schedule basis, b) after a predetermined number of queries by the user, and c) each time an unconstrained query is run by the user” at page 4, [0049].

**As per claim 7**, Brown and Guthrie teach the method of claim 1 discussed above. Brown also teaches; “wherein generating tenant-level statistic is performed on a periodic basis” at page 5, [0058].

**As per claim 8**, Brown and Guthrie teach the method of claim 1 discussed above. Guthrie also teaches: “wherein generating includes determining a total number of distinct rows accessible for each of said plurality of tenant” at Col. 5 lines 1-6.

**As per claim 9**, Brown and Guthrie teach the method of claim 8 discussed above. Brown also teaches “the tenant level statistics are stored to a tenant metadata table” at page 4, [0045].

**As per claim 10**, Brown and Guthrie teach the method of claim 1 discussed above. Guthrie also teaches: “wherein at least one column of one of said table include data associated with two or more tenants” at Col. 6 lines 35-50.

**Claims 11-25** recite a system and method comprising similar limitations as in claims 1-10. Claims 11-25 are therefore rejected by the same reasons.

**As per claim 26**, Brown and Guthrie teach the method of claim 1 discussed above. Brown also teaches “the generating tenant-level statistics comprises generating tenant-level statistics for each of said plurality of tenants for each of the data tables” at [0043].

**As per claim 27**, Brown and Guthrie teaches the method of claim 2 discussed above. Brown also teaches: “generating user-level statistics for each of the users of each of the tenants for each of the data tables” at [0043].

**As per claim 28**, Brown and Guthrie teaches the system of claim 11. Brown also teaches: “the statistics generating module is configured to generate tenant-level statistic for each tenant of the data tables” at [0043].

***Response to Arguments***

3. Applicant's arguments filed 4/9/2008 have been fully considered but they are not persuasive. The examiner respectfully traverses applicant's arguments.

Regarding claim 1, applicant argued that neither Brown nor Guthrie teaches "a multi-tenant database" and "generating tenant-level statistics" recited in the claim. Applicant however did not provide any definition, interpretation, explanation of these terms to show how Brown and Guthrie's teaching are different. The examiner relies on Applicant's specification for the definition of the claimed terms as follow:

**Multi-tenant database:**

"a centralized computer or set of computing devices serve and store applications and data for use by multiple tenants"  
(Applicant Specification, [0001])

"An example of a multi-tenant system is a computer system that is accessible to multiple independent parties to provide those parties with application execution and/or data storage".  
(Specification, [0002])

The preamble of claim 1 further provides details regarding the multi-tenant database:

"said multi-tenant database having one or more data tables, each table having one or more logical columns defining data categories and one or more logical rows associated with one or more tenants"

Based on this definition, the examiner therefore interprets “multi-tenant database” as a **database having one or more tables, accessible by two or more users.**

**Tenant-level statistics:**

Applicant's specification does not provide any clear definition for the terms. The plain meaning of "tenant-level" statistics" is statistics collected based on each tenant, as opposed to table-level statistics which are collected based on entire table. In view of the examiner's interpretation of "multi-tenant database" above (i.e. multi-tenant database having one or more data tables, each table having one or more rows associated with one or more tenants), consider the case where the table having one or more rows associated with one tenant, “tenant-level statistics” are statistics collected based on an entire table; in case the table having one or more rows associated with more than one tenants, the statistics are collected based on a subset of all rows in the table (i.e. only the rows associated with a particular tenant). The examiner therefore interprets “tenant-level statistics” as statistics collected based on a subset of rows in a table.

Brown therefore teach most of the limitations of claim 1. Brown teaches the step of generating tenant-level statistic for one or more of said plurality of tenants and optimizing the SQL query based on the tenant-level statistics at [0033]-[0034] and [0043]. In particular, Brow teaches:

“a faster mechanism is provided for collecting statistics of columns of a table in a database system. **Rather than collect statistics based on a full table scan**



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(wherein each row of the table is read), **statistics are collected based on** reading a sample (that is **less than all the rows**) of the table" (paragraph [0043])

Brown then uses the collected statistics for optimizing the query:

"For a given **query**, the **optimizer module 18** identifies a query plan that has the lowest, or one of the lowest, response time....

...the **optimizer module 18 uses statistics** and/or sampling techniques to reduce the search space in optimizing queries" (paragraph [0033])

Applicant argued that Brown at paragraph 33-34 fails to even mention "the statistics". On the contrary, as seen in the text portion reproduced above, Brown clearly teaches "the **optimizer module 18 uses statistics** and/or sampling techniques to reduce the search space in optimizing queries" at [0033].

Applicant further argued that Brown does not teach generating statistics based on a subset of rows". On the contrary, Brown clearly teaches "**Rather than collect statistics based on a full table** scan (wherein each row of the table is read), **statistics are collected based on** reading a sample (that is **less than all the rows**) of the table" at [0043].

Brown does not explicitly teaches the data table is accessible by two or more users. However, Guthrie teaches a multi tenant database table contain multiple set of data (i.e., rows) accessible by a plurality of users:

"Tables in database system 280 contain multiple sets of enterprises data, where access to each of the sets is limited to a user of a particular enterprises...

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Enterprise data 241 contains rows that may be accessed by only enterprise user 221. Likewise, enterprise data 242, 243, and 244 may only be accessed by enterprise users 222, 223, and 224, respectively" (Guthrie, Col. 4 line 65 to Col. 5 line 6).

Thus , it would have been obvious to implement Brown's query optimization method on Guthrie's multi-tenant database because "one of the goals of a database management system is to optimize the performance of queries for access and manipulation of data stored in the database" (Brown, [0004]). Both Brown and Guthrie are in the same filed of endeavor. "It is common sense that familiar items may have obvious uses beyond their primary purposes, and a person of ordinary skill in the art often will be able to fit the teachings of multiple patents together like pieces of a puzzle." KSR Int'l Col. V Teleflex, Inc., 127 S. Ct. 1727, 1732 (2007).

In light of the foregoing arguments, the 35 U.S.C 103 rejection is hereby sustained.

### ***Conclusion***

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh B. Pham whose telephone number is (571) 272-4116. The examiner can normally be reached on Monday through Friday 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on (571) 272-3978. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Khanh B. Pham/  
Primary Examiner  
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June 26, 2008